

FORM PTO-1300 (REV. 12-2001) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER PAA-102-A U.S. APPLICATION NO. (If known, see 37 CFR 1.5)
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		10/031162
INTERNATIONAL APPLICATION NO PCT/UA00/00023	INTERNATIONAL FILING DATE 13 JULY 2000	PRIORITY DATE CLAIMED 15 JULY 1999
TITLE OF INVENTION A NEEDLE FOR USE IN REFLEXOTHERAPY, AND AN APPLICATOR USING THE SAME		
APPLICANT(S) FOR DO/EO/US NIKOLAI GRIGORIEVICH LYAPKO		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
1 <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371 2 <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371 3 <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below. 4 <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31). 5 <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) a <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau) b <input type="checkbox"/> has been communicated by the International Bureau c <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US) 6 <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)) a <input checked="" type="checkbox"/> is attached hereto b <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4) 7 <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) a <input checked="" type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b <input type="checkbox"/> have been communicated by the International Bureau. c <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired d <input type="checkbox"/> have not been made and will not be made 8 <input checked="" type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)) 9 <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10 <input checked="" type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).		
Items 11 to 20 below concern document(s) or information included:		
11 <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98 12 <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 13 <input type="checkbox"/> A FIRST preliminary amendment. 14 <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 15 <input type="checkbox"/> A substitute specification 16 <input type="checkbox"/> A change of power of attorney and/or address letter. 17 <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter 2 and 35 U.S.C. 1.821 - 1.825. 18 <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4) 19 <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). 20 <input checked="" type="checkbox"/> Other items or information PTO-2038		

<p style="font-size: 1.2em; font-weight: bold;">107031162</p>	<p style="text-align: center; font-size: 0.8em;">INTERNATIONAL APPLICATION NO PCT/UA00/00023</p>	<p style="text-align: center; font-size: 0.8em;">ATTORNEY'S DOCKET NUMBER PAA-102-A</p>																		
<p>21 <input checked="" type="checkbox"/> The following fees are submitted</p> <p>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):</p> <p>Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1040.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00</p> <p>International preliminary examination fee (37 CFR 1.482) paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00</p>		<p style="text-align: center; font-weight: bold;">CALCULATIONS PTO USE ONLY</p>																		
<p style="text-align: right;">ENTER APPROPRIATE BASIC FEE AMOUNT =</p>		<p>\$ 890.</p>																		
<p>Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e))</p>		<p>\$ 130.</p>																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">CLAIMS</th> <th style="text-align: center;">NUMBER FILED</th> <th style="text-align: center;">NUMBER EXTRA</th> <th style="text-align: center;">RATE</th> <th style="text-align: right;">\$</th> </tr> <tr> <td>Total claims</td> <td style="text-align: center;">9 - 20 =</td> <td style="text-align: center;">0</td> <td style="text-align: center;">x \$18.00</td> <td style="text-align: right;">\$ 0</td> </tr> <tr> <td>Independent claims</td> <td style="text-align: center;">2 - 3 =</td> <td style="text-align: center;">0</td> <td style="text-align: center;">x \$84.00</td> <td style="text-align: right;">\$ 0</td> </tr> </table>	CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	Total claims	9 - 20 =	0	x \$18.00	\$ 0	Independent claims	2 - 3 =	0	x \$84.00	\$ 0	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td style="text-align: center;">1</td> <td style="text-align: center;">+ \$280.00</td> <td style="text-align: right;">\$ 280.</td> </tr> </table>	MULTIPLE DEPENDENT CLAIM(S) (if applicable)	1	+ \$280.00	\$ 280.
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<p style="text-align: right;">TOTAL OF ABOVE CALCULATIONS =</p>		<p>\$ 1300.</p>																		
<p><input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.</p>		<p>\$ 650.</p>																		
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<p>Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f))</p>		<p>0</p>																		
<p style="text-align: right;">TOTAL NATIONAL FEE =</p>		<p>\$ 650</p>																		
<p>Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property.</p>		<p>0</p>																		
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<p>Amount to be refunded:</p>		<p>\$ 0</p>																		
<p>charged:</p>		<p>\$ 650.</p>																		
<p>a. <input type="checkbox"/> A check in the amount of \$ _____ to cover the above fees is enclosed.</p> <p>b. <input type="checkbox"/> Please charge my Deposit Account No _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. <input type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No _____. A duplicate copy of this sheet is enclosed.</p> <p>d. <input checked="" type="checkbox"/> Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.</p>																				
<p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.</p>																				
<p>SEND ALL CORRESPONDENCE TO</p>																				
<p>Irving M. Weiner Weiner & Burt, P.C. P.O. Box 186 Harrisville, MI 48740</p>		<p style="text-align: center;"> _____ Irving M. Weiner NAME 22168 REGISTRATION NUMBER</p>																		

A NEEDLE FOR USE IN REFLEXOTHERAPY, AND AN APPLICATOR USING
THE SAME

Field of Invention

5 The present invention relates to devices intended for stimulating specific reflex areas or individual reflex points of the human body, and particularly to needles for use in reflexotherapy (i.e. acupuncture and application acupressure) and in applicators, and may be used both at medical institutions and under home
10 conditions. The needles may be used either as component parts of applicators or as independent instruments for practising acupuncture.

Background of the Invention

15 The most relevant device to the proposed needle comprises a needle having a base in the form of a rod member provided with a sharpened portion at one end and a head portion at the opposite end thereof, said rod being made of steel, copper, chromium, nickel, or silver, and with one layer of solid coat made of chromium, copper, silver, or nickel over the whole base of the needle (SU-A-
20 1797889).

Solid coat of the needle base restricts the possibilities of electrophoresis since only one microelement is delivered to the user's body (either from the needle surface or from the base thereof if the needle is not provided with a coat), as well as insignificant amount of the needle base microelement due to diffusion through
25 through the coat. Besides, no microcurrents are available within any needle, thereby eliminating its electrical effect on a corresponding area of the user's body and causing insufficient intensity of electrophoresis. In addition, the presence of a solid coat results in a rather high consumption of valuable coating materials, e.g. silver. The narrow range of materials (i.e. copper, nickel, silver) considerably
30 restricts selection of microelements required by the user.

Known in the art is an applicator comprising a base member and needles fixed therein and provided with sharpened portions and heads, wherein needle bases are made of steel, copper, chromium, nickel, or silver, and coats are made

of copper, chromium, nickel, or silver; these materials, upon being brought into contact with epidermis, form galvanic couples (SU-A-1797889).

This applicator provides a limited set of materials, thereby restricting the set of microelements to be delivered to the user's body, i.e. possibilities of electrophoresis; in addition, it restricts the possibility of presetting required parameters of microcurrents. Application of coats to the whole bases of needles provides the possibility of generating microcurrents only between needles made of dissimilar materials, while eliminating such microcurrents developed between dissimilar materials of individual needles in the user's body, thereby eliminating generation of a three-dimensional complicated heterogeneous electrical field in the user's epidermis; this in turn restricts the efficiency of application and results in insufficient smoothing of the electrical field, disturbed by a disease, in the user's skin upon application, and causes insufficient efficiency of electrophoresis.

15 Brief Description of the Invention

The main object of the present invention consists in improving the needle for use in reflexotherapy by way of developing an area of contact thereof with the user's body, said area consisting of at least two materials having different electrochemical potentials to provide the flow of microcurrents between these materials, and by expanding the set of materials used to produce the needle base and coats, thereby ensuring both mechanical and electrical action of the needle on a corresponding area of the user's body; providing a reasonable selection of materials for the needle base and coats, required to preset microcurrent parameters; expanding the possibilities of electrophoresis through the transfer of a broader set of microelements to the user's body, and improving electrophoresis intensity due to microcurrents.

Another object of the present invention consists in improving the applicator by way of providing at least some of the needles with solid and/or partial coats, while forming in the case of a partial coat and close to the sharpened portion an area consisting of at least two materials having different electrochemical potentials, i.e. an area of contact between the needles and the user's epidermis, and expanding the set of materials used for making needle bases and coats, thereby generating a three-dimensional complicated heterogeneous electrical field

of microcurrents between the needles, providing microcurrents between the bases of individual needles and coats thereof; presetting required parameters of microcurrents, smoothing by way of electrophoresis the uniformity of electrical field of the user's skin, said uniformity being disturbed by a disease; delivering a greater set of microelements to the user's body, and intensifying the process of this delivery.

The object set forth is achieved by that in the needle for use in reflexotherapy, having a base in the form of a rod member provided with a sharpened portion at one end thereof, said rod being made of steel, copper, chromium, nickel, or silver, and with coat made of chromium, nickel, copper, or silver, according to the invention the coat of the needle base is made partial with formation, close to the sharpened area, of a region composed by at least two materials having different electrochemical potentials, while the base and the coat are made of chemical elements selected from a group additionally including cobalt, aluminium, magnesium, zinc, tin, titanium, vanadium, beryllium, gold, platinum, palladium, strontium, tellurium, and alloys and oxides thereof.

Partial coat of the needle base with the formation of an area close to the needle sharpened portion, i.e. an area of contact between the needles and the user's body, consisting of two or more materials having different electrochemical potentials results in generation, in the user's body, of galvanic currents between these materials (needle base and coat perform the function of electrodes, and the fluid contained in the user's body and particularly in epidermis, the function of electrolyte), said currents flowing in the planes perpendicular to the user's skin, thereby ensuring both mechanical and electrical action of a needle on a corresponding area of the user's body, as well as expanding the possibilities of electrophoresis (microelements are transferred to the user's body both from the needle base and from coat/coats) and improving intensity thereof. Expansion of the set of chemical elements expands the possibilities of electrophoresis since it becomes possible to select elements necessary for each individual user from the wider set of such elements. In addition, it permits the use of inexpensive, hard and durable materials such as steel, copper, brass etc. for the needle base, and soft, expensive and rare materials such as tin, gold, silver etc. for coats, the use of expensive and rare materials being possible in substantially smaller amounts; besides, it provides the possibility of generating microcurrents with preset

parameters through an appropriate combination of materials for needle bases and coats.

Here, the area of the needle surface from the sharpened portion side can be formed either by the needle base and coat or by coat which may be applied
 5 either to the needle base except the sharpened portion thereof, or only to the sharpened portion.

Such arrangement provides the simplest way of obtaining a potential difference between the needle base and coat. In addition, application of coats from valuable and rare materials (gold, silver, platinum, palladium etc.) only to the
 10 sharpened portion of the needle provides substantial savings of these materials.

The area of the needle surface from the sharpened portion side is the most expedient to be formed by the needle base and several layers of coats of various materials, each layer being stripped at the end face thereof close to the needle sharpened portion.

The potential difference between each pair of adjacent coat layers and pairs
 15 of other layers gives rise to a combination of various galvanic microcurrents in the point of contact between the needle and epidermis, i.e. to heterogeneous electrical field; this phenomenon results in an increase of electrical action of the needle on epidermis and provides transfer of microelements of all the coat layers into the
 20 body, said transfer being intensified by galvanic microcurrents. Such arrangement provides maximum increase of the effects of reflexotherapy and electrophoresis.

It would be also expedient to construct the area of the needle surface from the sharpened portion side from a multilayer coat applied to the whole needle
 25 base, and a coat applied on the top of the above multilayer coat in the sharpened portion area.

Such arrangement will cause generation of a galvanic microcurrent between the coats applied to the needle sharpened portion and the base thereof, and resulting intensification of transfer of microelements from both external layers
 30 of coats and from internal layers due to diffusion. In addition, it permits the use of materials that are useful for reflexotherapy but have insufficient hardness and durability, in the form of coats applied to a hard and durable base.

Here, in a portion of the needle surface, composed from at least one layer of coat applied to the whole needle base, and a coat applied to the needle sharpened portion on top of the above one layer, each layer of coat can be

stripped at the end face thereof close to the needle sharpened portion, thereby increasing the number of microcurrents and intensifying electrophoresis.

In addition, one or more coat layers can be applied by spraying, thereby producing dense or loose layers.

Looseness of coat layers, and particularly external layers, promotes outward diffusion of microelements from internal layers.

The object set forth is also achieved by that in applicator having a base member and needles fixed therein, each needle having a base in the form of a rod member provided with a sharpened portion and a head portion, said needle bases being made of steel, copper, chromium, nickel, or silver, and with a coat made of chromium, nickel, copper, or silver, according to the invention at least some needles are provided with solid and/or partial coats, while forming in the case of a partial coat and close to the sharpened portion an area consisting of at least two materials having different electrochemical potentials, and needle bases and coats are made of chemical elements selected from a group additionally including cobalt, aluminium, magnesium, zinc, tin, titanium, vanadium, beryllium, gold, platinum, strontium, tellurium, and alloys and oxides thereof. Microcurrents between needle bases and coats are flowing in the planes that pass along the longitudinal axes of needles, and microcurrents between the needles, in the planes that are perpendicular or inclined to the above planes, thereby generating a three-dimensional complicated heterogeneous electrical field in the epidermis.

An increase of the set of chemical elements results in expansion of possibilities of electrophoresis since it permits to select required elements from a wider range thereof, and to use the whole set of such elements in a single applicator, particularly in case of partial multilayer coating of individual needle bases with different materials, where a number of needle bases and coats are brought into contact with the user's epidermis; the use of a wide set of materials permits to preset required parameters of the electrical field through an appropriate combination of materials of needle bases and coats. In addition, the above microcurrents accelerate the transfer of microelements to the user's body, thereby increasing electrophoresis intensity. Diversity of electrobiochemical conditions of epidermis during interaction thereof with various materials of needle bases causes an independent adjustment of microcurrent parameters between the needles made of different materials, and microcurrents between different materials of

individual needles, as well as electrophoresis parameters. A higher heterogeneity of the electrical field causes smoothing of the electrical field in the user's skin, disturbed by a disease

It is expedient to arrange needles in the applicator in such way that adjacent needles comprise different base and coat materials.

Such arrangement of needles in the applicator results in generation, in various points of contact between the body and individual needles, of microcurrents having different parameters, and the contact between the body and various materials of individual needles, thereby increasing heterogeneity of the electrical field and expanding the range of microelements transferred from needle bases and coat layers to the user's body; in addition, it accelerates electrophoresis and intensifies smoothing, as a result of reflexotherapy, of the violated uniformity of the electrical field of the user's skin.

Brief Description of Drawings

The invention is further described in more detail in terms of specific embodiments thereof and with reference to the accompanying drawings, in which:

Fig.1 shows a cross-section of the schematic drawing of a needle provided with a single-layer coating applied to the needle base except the sharpened portion thereof, or only to the sharpened portion, together with fragments of applicator and user's body;

Figs 2 and 3 demonstrate schematic drawings of stripped sharpened portion of the needle of the invention, shown in Fig.1;

Fig.4 shows schematic drawing of generation of galvanic microcurrent in the epidermis between the base and coat of the needle of the invention, shown in Fig.1;

Fig.5 demonstrates schematic drawing of the needle of the invention provided with coat only on the sharpened portion thereof;

Fig.6 shows schematic drawing of the needle of the invention, provided with coated sharpened portion and stripped apex of this portion;

Fig.7 demonstrates schematic drawing of the needle of the invention, provided with a two-layer coat applied to the needle base except the sharpened portion thereof;

Fig.8 shows schematic drawing of the needle of the invention, provided with a single-layer coat of the needle base and the coat applied to the sharpened portion on top of the first layer;

Fig.9 demonstrates schematic drawing of the needle of the invention, provided with a single-layer coat of the needle base, the coat applied to the sharpened portion on top of the first layer, and the apex of the sharpened portion that contains no coat;

Fig.10 shows schematic drawing of the needle of the invention, provided with a three-layer coat of the needle base, the coat applied to the sharpened portion on top of the above three layers, and the apex of the sharpened portion that contains no coat;

Fig.11 demonstrates top view of a fragment of the schematic drawing of the applicator of the invention;

Fig.12 shows section A-A of the applicator of the invention, shown in Fig.11.

Preferred Embodiment of the Invention

Needle 1 of the applicator (Fig.1) comprises rod member 2 provided with sharpened portion 3 at one end and head 4 at the other end thereof. Needle 1 is fixed in base member 5 of the applicator so that its part provided with sharpened portion 3 protrudes above surface 6 of base member 5. Area 7 close to sharpened portion 3, i.e. the area of contact between needle 1 and epidermis 8, includes either side surface of needle 1 from sharpened portion 3 to surface 6 or a portion of this surface, depending on required depth of penetration of needle 1 into epidermis 8. The depth of penetration depends on a pressure acting on the applicator, density of needles arrangement and sharpness of their sharpened portions, area 7 including at least two materials having different electrochemical potentials; in the given case, as shown in Fig.1, these are material of needle 1 base and material of layer 9 of the coat applied to the base of needle 1 except sharpened portion 3 thereof. In embodiments of the invention, such coat may be applied to the base of a needle except e.g. a part of the sharpened portion or

except sharpened portion 3 and a part of rod 2 close to sharpened portion 3 since it is rather difficult to coat the whole rod with exact exception of sharpened portion 3. The base of needle 1 can be made of iron or alloy thereof, e.g. steel, and layer 9 may be made e.g. of nickel, chromium, zinc, or copper. Needle 1 may be made of copper or alloy thereof, e.g. of brass, and layer 9 of the coat may be made of nickel, chromium, or silver. Here, it is expedient to coat nickel with chromium. The coat may be applied with the use of any method known in the art, e.g. by dipping, spraying, or galvanising.

It is expedient to apply layer 9 of the coat to whole needle 1, including sharpened portion 3 thereof, and then to strip sharpened portion 3 by removing the coat e.g. by grinding off the coat 9 next to sharpened portion 3 to form a cone (Fig.2), said grinding off being carried out over conical surface 10 with removal of part 11 of layer 9, or by cutting off the coat over plane 10 (Fig.3) with removal of part 11 of layer 9.

Operation of the needle of the invention consists in the following.

Upon penetration of needle 1 (Fig.4) into the user's body, particularly into epidermis 8 comprising a liquid ionised constituent, the difference of electrochemical potentials between the material of the base of needle 1 and the material of layer 9 of the coat results in generation of galvanic microcurrent G, i.e. the proposed design of the needle develops conditions where a galvanic cell with electrodes (material of the base of needle 1 and layer 9 of the coat) interacts with electrolyte (liquid ionised part of body 8). In other words, mechanical action caused by penetration of needle 1 into epidermis 8 is additionally accompanied by the action of galvanic microcurrent, G, of the electrical field on the user's body. In addition, the possibility is provided to carry out transfer of microelements both from sharpened portion 3 of the needle and from layer 9 of the coat, such transfer being considerably intensified through the presence of galvanic microcurrent, G. Thus, intensification of the effects of both reflexotherapy and electrophoresis are achieved.

In another preferred embodiment of the present invention, shown in Fig.5, coat 12 may be applied to sharpened portion 3 of needle 1. The base of needle 1 and coat 12 may be made of the same materials as specified in the previous embodiment of the invention. This embodiment however is expedient to be carried out when introducing precious and rare materials such as platinum, gold, silver,

and platinum in the user's body, since such arrangement results in considerable decrease of their consumption (only sharpened portion 3 rather than the whole base of needle 1 are coated with these metals).

5 The needle made in compliance with this embodiment operates similarly to the previous case.

When stripping a part of sharpened portion 3 as shown in Fig.6, the following galvanic couples are formed: between apex 13 of sharpened portion 3 of needle 1 and coat 14 (galvanic microcurrent G_1), and between coat 12 and rod 2 (galvanic microcurrent G_2), thereby intensifying the electrical action of needle 1 and electrophoresis.

10 The area of contact between needle 1 and user's epidermis 8 (Fig.7) may include the base of needle 1 and several, e.g. two layers 15 and 16 of coat, applied to said base and stripped close to sharpened portion 3 of needle 1. In this case, three different galvanic couples are formed: layer 15 of coat – sharpened portion 3 (galvanic microcurrent G_3); layer 16 – sharpened portion 3 (galvanic microcurrent G_4), and layer 15 – layer 16 (galvanic microcurrent G_5). This fact further intensifies electrical action of the needle and provides transfer of microelements from all three materials to epidermis 8, i.e. needle 1 and layers 15 and 16. It should be also noted that transfer of microelements from rod 2 and layer 15, through layer 16 and into the user's body is also carried out due to diffusion, the amount of this transfer being substantial as a result of large contact area between rod 2 and layer 15, between layers 15 and 16, and between layer 16 and user's body. Needle 1 may be provided with still more layers of coat, which fact results in intensification of the action caused by electrical fields and electrophoresis, since in this case more various microelements are transferred to the user's body.

25 As shown in Fig.8, the area of contact between needle 1 and body 8 may include one coat layer 17 applied to the whole base of needle 1, and coat layer 18 on sharpened portion 3 of needle 1, applied on the top of layer 17. In this case, 30 layer 17 – layer 18 galvanic couple is formed (galvanic microcurrent G_6), and transfer of microelements from the base of needle 1 and layers 17, 18 occurs by diffusion, due to a larger area of contact between all the surfaces, i.e. in this embodiment electrophoresis outweighs the galvanic effect.

The latter of the above-disclosed embodiments of the invention may be somewhat modified if sharpened portion 3 is left without layers 17, 18, e.g. by way of grinding them off (Fig.9) (or due to quick wear during the use of applicator). In this case, G_6 galvanic microcurrent between layers 17, 18 is supplemented by G_7 galvanic microcurrent between layer 17 and sharpened portion 3, and G_8 galvanic microcurrent between layer 18 and sharpened portion 3. This intensifies the electrical action of needle 1 on epidermis 8 and results in a more pronounced electrophoretic effect.

As shown in Fig.10, the base of needle 1 may be provided with a multilayer coat, comprising e.g. layers 19, 20, 21 applied to the whole needle, and layer 22 applied only to sharpened portion 3 thereof. All these layers are cut away along plane 23, each layer being exposed to the surface of needle 1. This results in the formation of five different galvanic microcurrents (not shown), leading to a considerable intensification of the electrical action of needle 1 on epidermis 8, permitting the transfer of four various microelements, and thereby intensifying the effect of electrophoresis.

One or more layers of coat may be applied by spraying that results in formation of loose or dense layers. Loose layers of coat increase the flow of microelements, passing through them.

The order of location of materials on the needle, in the direction from the base toward the external layer, can be selected as follows:

Fe (steel) – Ni – Cu (or Pt, or Pd, or Au) – Ag;

Fe – Ni – Au;

Fe – Cr – Au;

Fe – Cr (or Ag, or Cu) – Cu (or Pt);

Fe – Zn – Cr;

Cu – Ag;

Cu – Ni – Cr.

The base of the needle is made of Fe or Cu or alloys thereof, e.g. steel or brass. Therefore, with the base made of Fe or steel, it is possible to apply coat layers of all the above metals in the specified order, e.g. first layer of nickel, second layer of copper (or platinum, or palladium, or gold), and third layer of silver.

Copper or brass base may be coated with silver, gold, platinum, palladium, and nickel with a thin layer of chromium.

Needles of the above types may be also used for acupuncture. In the latter case, the head member is replaced by a handle intended for fixing a physician's hand.

Still another object of the present invention comprises an applicator. As can be seen in Figs 11-12, the inventive applicator preferably comprises base member 5 with needles 24-32 fixed therein, at least a portion of needles 24-32 being provided with the area of contact between the needle and epidermis 8, said area formed by at least two materials having different electrochemical potentials. Needles 24-32 having different materials of base members and coats are located e.g. in the following order: one row 33 consists of solid copper needle 24; needle 25 having steel base and nickel coat and exposed sharpened portion 3; needle 26 having steel or iron base and solid copper coat layer 36 and silver (or gold, or platinum, or palladium) coat layer 37 on sharpened portion 3; needle 27 having iron or steel base with two-layer coat of zinc and chromium, and exposed sharpened portion 3; needle 28 having copper base and silver (or gold, or platinum, or palladium) coat on sharpened portion 3 etc. Another row 38 consists of needle 29 having copper or brass base and two-layer coat of nickel and chromium; copper needle 24; needle 30 with steel or iron base and two-layer coat of zinc and chromium; steel needle 31; needle 32 with copper or brass base and copper coat over the whole needle except sharpened portion 3 thereof etc. In subsequent rows, the order of location can be either similar or different; the critical point consists in that each needle has to be surrounded with needles whose bases and coats are made of different materials. Such arrangement accelerates electrophoresis and provides smoothing, as a result of reflexotherapy, the natural nonuniformity of the skin electrical field.

The applicator operates as follows:

Penetration of needles 24-32 into epidermis 8 generates the effect of mechanical irritation of a selected area of the user's body surface. At the same time, within the area of contact between needles 25, 26, 27, 28, 29, 30, 32 and the epidermis, G_T galvanic microcurrents are generated (said microcurrents have been disclosed herein for various embodiments of the needles); these microcurrents have their action lines in the planes of needle axes and cause the effect of weak

electrical fields on the area of the user's body. In addition, different electrical potentials of various needles cause generation of G, galvanic microcurrents between adjacent needles whose action lines are disposed in the planes perpendicular or inclined with respect to the action lines of microcurrents between materials of individual needles. These currents are imposed on galvanic microcurrents of individual needles, thereby generating a three-dimensional complicated heterogeneous electrical field in the user's epidermis. Various microelements are transferred from needles 24-32 into epidermis 8, the intensity of this transfer being amplified by microcurrents existing inside epidermis 8. Due to diversity of electrobiochemical conditions of epidermis 8 during interaction thereof with materials of needle surfaces, epidermis 8 performs automatic adjustment of microcurrent and electrophoresis parameters.

Arrangement of needles in the applicator, as well as base and coat materials are selected depending on the desired action of the applicator on selected areas of users' bodies (required intensity of mechanical action, electrical fields, saturation with certain microelements).

In the simplest case, the inventive applicator may use two kinds of needles, e.g. copper (brass) or steel needles, or needles having single type of coat/coats.

The needles may be also arranged in rows, each row being formed by the needles made of the same or similar materials, and differing by needle materials from the needles of other rows, thereby causing generation of a more uniform electrical field.

To manufacture needle bases and coats, the use can be made of chemical elements selected from the group comprising copper, iron, nickel, chromium, cobalt, aluminium, magnesium, zinc, tin, silver, titanium, vanadium, beryllium, gold, platinum, palladium, strontium, tellurium, and alloys and oxides thereof. This permits to produce durable and inexpensive needle bases provided with coats of small quantities of precious and rare materials, to expand the set of materials used, and thereby to create numerous galvanic couples generating numerous microcurrents having various parameters. This also permits the transfer of numerous microelements into the user's body.

I claim:

1. A needle for use in reflexotherapy, having a rod member provided with a sharpened portion at one end thereof, said rod being made of steel, copper, chromium, nickel, or silver, and with coat made of chromium, nickel, copper, or silver, characterized in that the coat of the needle base is made partial with formation, close to the sharpened area, of a region composed by at least two materials having different electrochemical potentials, while the base and the coat are made of chemical elements selected from a group additionally including cobalt, aluminium, magnesium, zinc, tin, titanium, vanadium, beryllium, gold, platinum, palladium, strontium, tellurium, and alloys and oxides thereof.

2. A needle as defined in claim 1, characterized in that the area of the needle surface close to the sharpened portion is formed by the needle base and the coat applied to the needle base except the sharpened portion thereof.

3. A needle as defined in claim 1, characterized in that the area of the needle surface close to the sharpened portion is formed by the needle base and the coat applied only to the sharpened portion.

4. A needle as defined in claim 1, characterized in that the area of the needle surface close to the sharpened portion is formed by the needle base and several layers of coat made of various materials, each layer being stripped at the end face thereof close to the needle sharpened portion.

5. A needle as defined in claim 1, characterized in that the area of the needle surface close to the sharpened portion is formed by a multilayer coat applied to the whole needle base, and a coat applied on the top of the above multilayer coat in the sharpened portion area.

6. A needle as defined in claim 5, characterized in that in the area of the needle surface composed by a multilayer coat applied to the whole needle base and a coat applied on the top of the above multilayer coat in the sharpened portion area, each layer of the coat is stripped from the end face thereof close to the sharpened portion of the needle.

7. A needle as defined in any of claims 1-6, characterized in that one or more coat layers are applied by spraying, thereby producing loose or dense layers.

8. An applicator comprising a base member and needles fixed therein, each of the needles comprising a base with a rod, a sharpened portion, and a head, said needle bases being made of steel, copper, chromium, nickel, or silver, and provided with a coat made of chromium, nickel, copper, or silver, characterized in that at least a portion of needles are made with solid and/or partial coats; in case of partial coating of needle bases, the areas close to sharpened portions thereof are formed by at least two materials having different electrochemical potentials, while needle bases and coats are made of chemical elements selected from a group additionally including cobalt, aluminium, magnesium, zinc, tin, titanium, vanadium, beryllium, gold, platinum, palladium, strontium, tellurium, and alloys and oxides thereof.

9. An applicator as claimed in claim 8, characterized in that the needles are arranged in the applicator in such way that adjacent needles comprise different base and coat materials.

Abstract

A Needle for Use in Reflexotherapy, and an Applicator Using Same

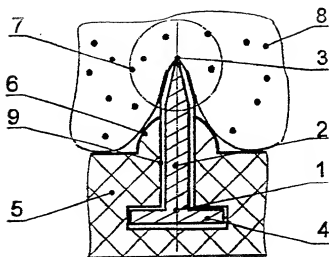
5 The inventive needle may be used for reflexotherapy (i.e. acupuncture and application acupressure) both at medical institutions and under home conditions. The needle may be used either as a component part of applicators or as independent instrument for practising acupuncture. The needle (1) for use in reflexotherapy comprises a base in the form of a rod member (2) provided with a sharpened portion (3) at one end thereof, said rod being made of steel, copper, chromium, nickel, or silver, and a coat made of chromium, nickel, copper, or silver.

10 The novel feature of the needle consists in that the coat of the needle (1) base is made partial with formation, close to the sharpened area, of a region (7) composed by at least two materials having different electrochemical potentials, while the base and the coat are made of chemical elements selected from a group additionally including cobalt, aluminium, magnesium, zinc, tin, titanium, vanadium, beryllium, gold, platinum, palladium, strontium, tellurium, and alloys and oxides thereof. The invention provides both mechanical and electrical actions of the needle on a corresponding area of the user's body, and appropriate selection of

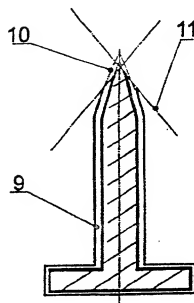
15 materials for needle base and coats with the aim of presetting parameters of microcurrents; it permits to expand the possibilities of electrophoresis due to transfer of a greater quantity of microelements into the the user's body, and to intensify electrophoresis due to the presence of microcurrents. Also claimed is an applicator using such needle. Such applicator provides generating a three-dimensional complicated heterogeneous electrical field of microcurrents between the needles, and microcurrents between the bases of individual needles and coats thereof; presetting required parameters of microcurrents, smoothing the uniformity of electrical field of the user's skin by way of electrophoresis, said uniformity being disturbed by a disease; introducing a greater set of microelements

20 in the user's body, and intensifying the process of this introduction.

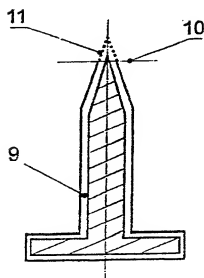
Fig.1



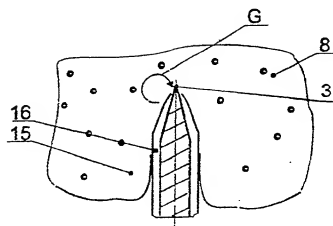
Фиг. 1



Фиг. 2

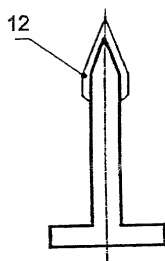


Фиг. 3

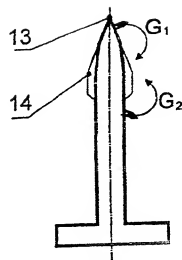


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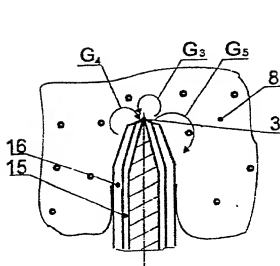
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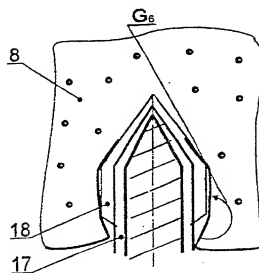
Фиг. 5



Фиг. 6

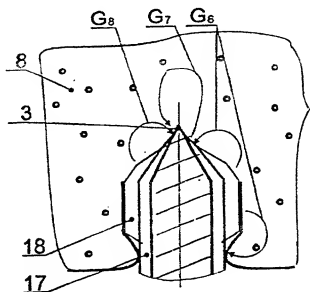


Фиг. 7

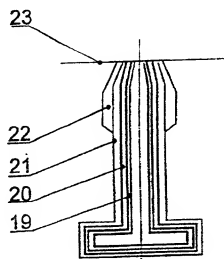


Фиг. 8

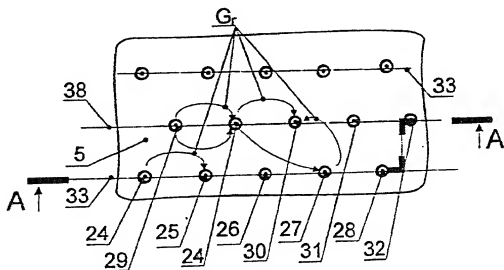
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Фиг. 9

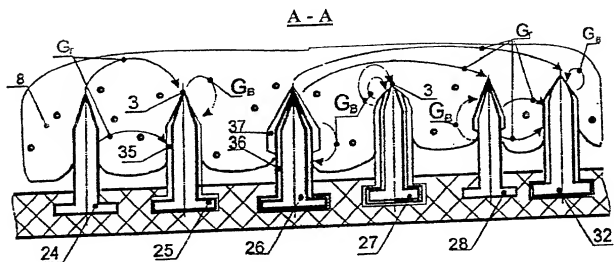


Фиг. 10



Фиг. 11

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Фиг. 12

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As the below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; I believe that I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled A NEEDLE FOR USE IN REFLEXOTHERAPY, AND AN APPLICATOR USING THE SAME, as disclosed in U.S. Patent Application 10/031,162 filed January 15, 2002.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37, Code of Federal Regulations § 1.56, and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) on which priority is claimed.

Ukrainian Patent Application 99074080 filed July 15, 1999; and
International Application PCT/UA00/00023 filed July 13, 2000

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

NONE

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

NONE

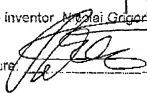
POWER OF ATTORNEY: As the named inventor, I hereby appoint the following attorneys to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: Irving M. Weiner, Reg. No. 22,168; and Pamela S. Burt, Reg. No. 27,861. (2)

SEND CORRESPONDENCE TO: Irving M. Weiner
Weiner & Burt, P.C.
635 N. US-23, P.O. Box 196
Harrisville, MI 48740

DIRECT TELEPHONE CALLS TO: Irving M. Weiner, (969) 724-7400

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole inventor: Mykola Grigoriyevich Lyanko

Inventor's signature: 

Date: 09/04/2002

Country of Citizenship: Ukraine

Residence: Donetskoy, Ukraine

Post Office Address: 8, m-n Soryachnyy, app. 21, Krassogorivka,
Marjinsky rayon,
Donetskoy obl. 85402, Ukraine

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